Helium II State Equation From 0 K to the Lambda Line

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A new state equation for Helium II has been fitted to available experimental data from 0.06 K to the lambda line. The equation includes terms representing phonon contributions, roton contributions, and divergences at the lambda line. Along the saturation line the equation is anchored to a 1998 comprehensive correlation of properties by Donnelly et al. Approaching the lambda line, the equation is asymptotic to critical data and major theoretical analyses by Kierstead, Ahlers and others. The accuracy and wide range of this equation suggest it as a replacement for the NIST standard reference code for Helium II.